



UNITED STATES PATENT AND TRADEMARK OFFICE

UNITED STATES DEPARTMENT OF COMMERCE
United States Patent and Trademark Office
Address: COMMISSIONER FOR PATENTS
P.O. Box 1450
Alexandria, Virginia 22313-1450
www.uspto.gov

APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/800,854	03/16/2004	Jason Keith Redi	03-4049	1305

7590 03/16/2006

Verizon Corporate Services Group Inc.
Mail Code: HQE03H14
600 Hidden Ridge Drive
Irving, TX 75038

EXAMINER

ISSING, GREGORY C

ART UNIT PAPER NUMBER

3662

DATE MAILED: 03/16/2006

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary	Application No.	Applicant(s)	
	10/800,854	REDI ET AL.	
	Examiner	Art Unit	
	Gregory C. Issing	3662	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☐ Responsive to communication(s) filed on ____.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-44 is/are pending in the application.
- 4a) Of the above claim(s) ____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) ____ is/are allowed.
- 6) ☒ Claim(s) 1-44 is/are rejected.
- 7) ☐ Claim(s) ____ is/are objected to.
- 8) ☐ Claim(s) ____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on ____ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some * c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
 2. ☐ Certified copies of the priority documents have been received in Application No. ____.
 3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).
- * See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- | | |
|--|---|
| 1) <input checked="" type="checkbox"/> Notice of References Cited (PTO-892) | 4) <input type="checkbox"/> Interview Summary (PTO-413)
Paper No(s)/Mail Date. ____. |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948) | 5) <input type="checkbox"/> Notice of Informal Patent Application (PTO-152) |
| 3) <input checked="" type="checkbox"/> Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08)
Paper No(s)/Mail Date <u>3/16/04</u> . | 6) <input type="checkbox"/> Other: ____. |

Art Unit: 3662

1. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

2. Claims 1-44 are rejected under 35 U.S.C. 103(a) as being unpatentable over either one of

Bandyopadhyay et al ("*An Adaptive MAC Protocol for Wireless Ad Hoc Community Network (WACNet) Using Electronically Steerable Passive Array Radiator Antenna*") or Singh et al ("*A MAC Protocol Based on Adaptive Beamforming for Ad Hoc Networks*"), in view of Crilly, Jr. et al (6,611,231), Speight (6,246,366), and Velazquez et al (2001/0003443).

3. Bandyopadhyay et al teach an ad hoc network which comprises a plurality of nodes, each of which is made aware of the angular location of each of its neighboring nodes so as improve communications there between using an adaptive/smart antenna array. It is shown to be known to utilize GPS to know the location of each node and its corresponding neighbors (p. 2897).

4. Singh et al also teach an ad hoc network utilizing adaptive beamforming wherein each node determines the angular location of all neighboring nodes, forms a directed beam towards the node that has a maximum power while forming nulls in all other identified directions, receives a packet of data, determines if the received packet is properly directed thereto and demodulates the data if it is properly destined. (Section IV).

5. Speight teaches a conventional mobile terminal comprising a plurality of antenna elements 2 and receivers for receiving a radio signal having a known training sequence, means for digitizing the received signal 6, means for recording the digitized signal 8, means for performing spatial processing on the recorded signals to produce a plurality of patterns at a plurality of different successive directions by weighting using complex weights 12 and summing 16 the signals received by each antenna, all in one frame. A metric is generated for each and a highest valued metric is selected for providing the directional control of the antenna for communicating.

Art Unit: 3662

6. Crilly, Jr. et al teach an adaptively steered antenna array for a wireless communication network including the storage of weights and the adaptive change thereof so as to reduce the processing load required for adaptively determining weights each time a signal is received.

7. Velazquez et al (2001/0003443) suggest updating a beam pattern, and hence beam weights, on the basis of the current location and heading information ([0057]-[0058]).

8. Each of Bandyopadhyay et al and Singh et al differ from the claimed subject matter since the method and apparatus for performing the front end receiver operations are not specified. Additionally, they do not show the storage of sets of weights associated with different radiation patterns. Lastly, they do not show the adaptive change of the weights in dependence on current location and heading, or relative movement between two nodes.

9. It would have been obvious to one having ordinary skill in the art at the time the invention was made to modify either one of Bandyopadhyay et al or Singh et al with the teachings of Speight who shows the conventionality of the front end of a digital beamformer including a receiver, digitizer and storage so as to enable the weighting circuits to form the multiple beams by transforming the received radio signals to a form suitable for digital processing. Further, it would have been obvious to utilize stored sets of weights to form the multiple beams including the omni-directional beam and the beams in the known directions of the neighboring nodes so as to reduce the processing load in view of the teachings of Crilly, Jr. et al who also show the dynamic changing of the weights due to the mobility of the communicating nodes of the wireless network. Lastly, it would have been obvious to the skilled artisan to account for the dynamic changes due to the changes in current location and heading of either or both of the communicating nodes in view of the teachings of Velazquez et al. The further dependent claims are deemed to be shown and/or are obvious to the skilled artisan in the design of an ad hoc wireless communication network using an adaptive antenna array with digital beamforming.

10. The prior art made of record and not relied upon is considered pertinent to applicant's disclosure.

Sanchez et al ("RDRN: A Rapidly Deployable . . .") teach an adaptive wireless network including a plurality of nodes utilizing GPS-derived location information to rapidly configure themselves. Each node is described as being equipped with a GPS receiver, a packet transceiver, and a phased array steerable

Art Unit: 3662

antenna system with digital beamforming (page 94), wherein a node is capable of forming multiple digitally formed beams in the direction of other nodes as well as an omni-directional beam (digital beamforming, however, is used only in the transmit direction).

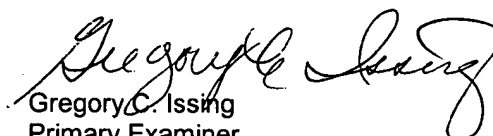
Yang et al ("MAC Protocol for Mobile Ad Hoc Network with Smart Antennas") teach a mobile ad hoc network (MANET) wherein it is known that each mobile terminal may comprise a smart antenna for generating omni-directional and beamformed beams such that after a successful RTS-CTS dialog using an omni-directional mode, the transmissions of the data packet is performed in the BF mode.

Guo (6,795,018) discloses wireless communications between multiple beamforming devices wherein it is taught that a set of weights can be stored for a finite set of angles and recalled when the relative angle between communicants is determined via the position.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Gregory C. Issing whose telephone number is (571)-272-6973. The examiner can normally be reached on Monday - Thursday 6:00 AM- 4:30 PM.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Thomas Tarcza can be reached on (571)-272-6979. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).


Gregory C. Issing
Primary Examiner
Art Unit 3662

gci